1. A VCR manufacturer receives 70% of its parts from factory A and the rest from factory B. Suppose that 3% of the outputs from A are defective, while only 2% of the outputs from B are defective.
2. Make a tree diagram

D 0.21

0.03

0.70

A

N 0.679

0.97

D 0.006

0.02

0.30

B

N 0.294

0.98

1. What is the probability that a received part is defective? **P(D) = 0.216**
2. If a randomly chosen part is defective, what is the probability that it came from factor A? From factory B?

**P(A|D) = 0.21** = **0.972 P(B|D) = 0.006 = 0.02778**

**0.216 0.216**

1. On the way to school you have to go through two stop lights. The probability that you will get stopped at the first light is 30%. If you make it through the first light the probability that you will get stopped at the second light is 40%. If you get stopped at the first light the probability that you get stopped at the second light is 20%.
2. Make a tree diagram

0.20

S2 0.06

S1

0.30

N2 0.24

0.80

S2 0.28

0.40

N1

0.70

N2 0.42

0.60

1. What is the probability that you get stopped at least once on the way to school?

**P(S1 and S2) = 0.06**

**P(S1 and N2) = 0.24 TOTAL = 0.58**

**P(N1 and S2) = 0.28**

1. What is the probability that you only would have to stop at one light?

**P(S1 and N2) = 0.24**

**P(N1 and S2) = 0.28 TOTAL = 0.52**

1. What is the probability that you would get stopped at the second light?

**P(S2) = 0.34**

1. What is the probability that you wouldn’t have to stop at all?

**P(N1 and N2) = 0.42**

1. A particular football team Is known to run 30% of its plays to the left and 70% to the right. A linebacker on an opposing team notes that the right guard shifts his stance most of the time (80%) when plays go to the right and that he uses a balanced stance the rest of the time. When plays go left, the guard takes a balanced stance 90% of the time and the shift stance the remaining 10%.

Sh 0.56

1. Make a tree diagram

0.80

0.70

R

B 0.14

0.20

Sh 0.03

0.10

0.30

L

B 0.27

0.90

1. What is the probability that the guard is balanced? **P(B) = 0.41**
2. What is the probability that a play will go to the left if the guard is balanced?

**P(L|B) = 0.27/0.41 = 0.6585**

1. Suppose that three branches of a local bank average, 120, 180, and 100 clients per day, respectively. Suppose further that the probabilities that a client will transact business involving more than $100 during a visit are .5, .6, .7, respectively. A client is chosen at random.
2. Make a tree diagram

0.50

B 0.15

1

0.50

N 0.15

0.30

0.60

B 0.27

2

0.45

N 0.18

0.40

0.25

0.70

B 0.175

3

0.30

N 0.075

1. What is the probability that the client will transact business involving over $100?

**P(B) = 595**

1. What is the probability that the client went to the first branch given that she transacted business involving over $100?

**P(1|B) = 0.15/0.595 = 2521**